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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/963,920	09/26/2001	Francis Barany	19603/3356 (CRF D-1595F)	1149

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EXAMINER

PONNALURI, PADMASHRI

ART UNIT	PAPER NUMBER
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1639

DATE MAILED: 10/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/963,920

Applicant(s)

BARANY ET AL.

Examiner

Padmashri Ponnaluri

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 120-125, 127, 128, 136, 137 and 148 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 120-125, 127, 128, 136, 137 and 148 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/16/04, 4/23/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

1. The amendment and response filed on 8/16/04 has been fully considered and entered into the application.
2. Claims 126 (solid support is microtitre plate), 127 (linker comprises silane), 129-135 (functional group other the elected 'carboxyl') withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species election, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 11072003.
3. This application contains claims 126, 127, 129-135, drawn to an invention nonelected with traverse in Paper No. 11072003. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Information Disclosure Statement

The references filed in the Information Disclosure Statements file don 8/16/04 and 4/23/04 have been fully considered and entered into the application.

Status of Claims

4. The preliminary amendment filed on 9/26/01 has been fully considered and entered into the application. Claims 1-119 and 138-147 have been canceled by the preliminary amendment filed on 9/26/01. And new claim 148 has been added by the amendment filed on 8/16/04.
5. Claims 120-125, 128, 136-137, and 148 are currently being examined in this application.

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6. The amendment filed on 8/16/04 amends the claims 120, 121, 124, 137. Claim 120 has been amended to include ‘ and substantially similar thermal stabilities’; and ‘capture oligonucleotide probes.’

Withdrawn Claim Rejections

7. The new matter rejection of record has been withdrawn in view of the amendments to the claims.

8. The following rejections of claims, under 35 USC. 112, second paragraph have been withdrawn in view of the amendments:

a) The rejection of ‘at least some of the array positions’ in claim 120; b) the rejection of ‘support suitable for coupling an oligonucleotide probe,...’

9. The obviousness-type double patenting rejection over U.S. Patent No. 6,506,594 B1, and the provisional obviousness-type double patenting over co-pending application 10/272,152, have been withdrawn in view of TDs filed on 8/16/04.

Maintained Claim Rejections

10. The art rejection of claims 120-125, 136-137, and newly added claim 148, under 35 USC. 102 (e) as being anticipated by US Patent 5,744,305, is maintained for the reasons set forth in the previous office action mailed on 2/19/04.

11. The art rejection of claims 120-125, 136-137, and newly added claim 148, under 35 USC. 102 (e) as being anticipated by US Patent 5,837,832, is maintained for the reasons set forth in the previous office action mailed on 2/19/04.

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12. The provisional obviousness-type double patenting rejection of claims 120-125, 128, 136-137, and newly added claim 148 over copending application 08/794,851 is maintained for the reasons set forth in the previous office action mailed on 2/19/04.

New Claim Rejections Necessitated by the Amendment

13. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

14. Claims 120-125, 128, 136-137, and 148 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a new matter rejection.

The instant claim recites an array of oligonucleotides.

The newly added limitation 'and substantially similar thermal stabilities' claimed in claim 120 has no clear support in the specification and the claims as originally filed. Applicants have not shown support for this limitation in the specification or claims as originally filed.

If applicants disagree, applicant should present a detailed analysis as to why the claimed subject matter has clear support in the specification

15. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

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16. Claims 120-125, 128 and 136-137 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 120 is indefinite by reciting 'substantilally similar thermal stabilities', the terms 'substantially' and 'similar' are relative terms. It is not clear similar thermal stability as compared to what. And further the thermal stability of a nucleotide sequence would be dependent on different parameters, such as the nucleotide sequence, the length of the sequence, and pH. Further applicants have not pointed out the support for this limitation in the specification. Applicants are requested to clarify or amend the claim.

The amended claim 120 recites 'an array of capture oligonucleotide probes on the solid support at array positions having greater than sixteen nucleotides....' Which is vague and indefinite because it is not clear which array positions have probes having greater sixteen nucleotides and further it is not clear the length of the probes at other array positions, which are not occupied by the probes of greater than 16 nucleotides. The amendment to the claim is confusing.

The newly amended claim 120 recites 'an array of oligonucleotide probes on the solid support...'; and 'an array of capture oligonucleotide probes on the solid support..'. It is not clear whether applicants mean that the 'the array of oligonucleotides' is same as the 'array of capture oligonucleotides' or the array of capture oligonucleotides bind to the array of oligonucleotides. Applicants are requested to clarify.

Response to Arguments

17. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

18. Applicant's arguments regarding the new matter rejection, and rejection of claims under 35 USC. 112, second paragraph are moot in view of the amendments and the withdrawal of the rejections.

19. Applicant's arguments filed on 8/16/04, regarding the rejection of claims over US Patent 5,744,305, have been fully considered but they are not persuasive.

Claims 120-125, 136-137 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 5,744,305 (FODOR et al).

The instant claim briefly recites an array of oligonucleotide probes on a solid support comprising: a solid support having an array of positions each suitable for attachment of an oligonucleotide probe; a linker or support suitable for coupling an oligonucleotide probe to the solid support attached to the solid support at each of the array positions; and an array of oligonucleotide probes on the solid support with at least some of the array positions being occupied by oligonucleotide probes having greater than sixteen nucleotides, wherein each oligonucleotide probe of the array differs from its adjacent oligonucleotide probe by at least 25 % of the nucleotides.

Fodor et al teach arrays of materials attached to a substrate. The reference claims are drawn to an array of oligonucleotides comprising: a plurality of different oligonucleotides attached to the surface of solid support at different predetermined positions (e.g., see claim 1) reads on the instant claim array. The reference claim 2 recites each different oligonucleotide is from about 4 to about 20 nucleotides in length (refers to at least some of the oligonucleotides having greater than sixteen nucleotides. And claim 4 recites that oligonucleotides are at least 20 nucleotides in length. The reference claim 9 recites that the oligonucleotides are attached to the surface of the solid support through a linker group (refers to the linker of the instant claims). The reference claim 8 recites that the solid support is glass. Claim 7 of the reference recites that the predefined regions of the support is physically separated from each other. The reference in column 6 (lines 34-38) teaches that separate synthesis regions for different

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polymers with, for example wells, raised regions, etched trenches or the like (refers to the instant claim 125). The reference teaches the use of glass microscope slide as solid support (e.g., see column 8, line 49) (refers to instant claims 122-123). Claims 121 and 137 are considered as intended use. Thus the reference clearly anticipates the claimed invention.

Applicants argue that no where does the outstanding office action make any effort to demonstrate^{that} ~~the~~ Fodor satisfies the "wherein each capture oligonucleotide probe of the array differs from its adjacent capture oligonucleotide probe by at least 25 % nucleotides" limitation of the claims.

Applicant's arguments have been fully considered and are not persuasive. Because Fodor et al claim 'array of polynucleotides', and plurality of different polynucleotides (refer to the probes of the instant claims), and wherein each of the polynucleotide is at least 4 nucleotides in length, and the different polynucleotides are attached to the surface at predefined regions. For example, the reference array probe is 4 nucleotides in length (as in claims 1, 15), and differs from the other probes in the array (which would include the adjacent probe), thus the reference probe is different by at least one nucleotide, which would make the probe is at least 25 % nucleotides different from the adjacent probe. (Note the previous claims have the limitation 'at least some of the array positions being occupied by oligonucleotide probes having greater than 16 nucleotides'). And further the instant amended claims do not recite that all the array positions are occupied by the probes, which have greater than 16 nucleotides. Thus, the reference array of different 4 nucleotide length polynucleotides would read on the instant claim array, and the reference further discloses each different polynucleotide of the array is at least 20 nucleotides in length. And the instant claims do not recite that the probes, which have greater than 16

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nucleotides have at least 25 % different nucleotides as compared to the adjacent nucleotides in the array. Thus, the rejections of record have been maintained.

And further the reference claims clearly discloses the new claim 148 limitation, 'wherein each of the capture oligonucleotide probe on the solid support has a different nucleotide sequence.' Thus, the newly added claim 148 is included in the rejection over US Patent 5,744,305.

20. Applicant's arguments filed on 8/16/04, regarding the rejection of claims over US Patent 5,837,832, have been fully considered but they are not persuasive.

Claims 120-124, 136-137 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 5,837,832 (CHEE et al).

Chee et al teach arrays of nucleic acid probes on biological chips. Chee et al methods for Making high density arrays of oligonucleotide probes on DNA chips, in which the probes have specific sequences and locations in the array to identify specific target nucleic acid (refers to array of positions and claim 121) (e.g., see column 1, lines 61-65). The reference teaches that the probes are arranged on the chip so that probes for a given position in the reference sequence are also adjacent to one another in the chip (e.g., see column 2). The reference teaches that the arrays of many thousands of oligonucleotide probes are arranged on a glass slide or chip (e.g., see column 5, refers to instant claim 123). The reference teaches that the arrays are synthesized directly on the support using VLSIPS technology. The reference teaches that the support is derivitized with functional groups such that the oligomers are attached to the substrate surface (refers to instant claim linker or support). The reference teaches that lengths ranging from 12 to 18 bases are preferred, although shorter and longer lengths can also be employed (refers to instant claim probes having greater than sixteen nucleotides) (e.g., see column 6, lines 4-7). The reference teaches individual probes, sets of probes and arrays of probe sets on chips, and gives an example of sequences (e.g., see column 10, lines 40-49). For example the reference sequences SEQ ID NO: 9 and SEQ ID NO: 10 differ by more than 25% nucleotides. And the reference teaches that sets of shorter probes derived from the 5' end of each probe and sets of longer probes made from this set by adding 5' end of each probe (refers to probes

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greater than 16 nucleotides of the instant claims). The reference teaches that methods for synthesizing large number of probe sets in a defined array in which the probes are arranged in the array by tiling method of the invention (refers to instant claim 122) (e.g., see column 12, lines 60-64). The reference clearly anticipates the claimed invention.

Applicants argue that Chee et al does not say that these sequences are adjacent to one another in the array. However, even if they were, they do not satisfy the "greater than sixteen nucleotides" or 'wherein each capture oligonucleotide probe of the array differs from its adjacent capture oligonucleotide probe by at least 25 % of the nucleotides' limitations of the claims.

Applicant's arguments have been considered and are not persuasive, because the instant claims do not recite that all the probes in the array are greater than 16 nucleotides in length. And applicant's interpretation of the reference SEQ ID Nos 9 and 10 is improper. The sequences of SEQ ID NO: 9 is 15 base pairs, and has the following sequence at position 1 is C, position 2 is C, position 3 is A, position 4 is A, position 5 is A, position 6 is G, position 7 is A, position 8 is T, position 9 is N, position 10 is A, position 11 is T, position 12 is A, and positions 13-15 have T (which would be CCAAAGATNATATTT); which is different from SEQ ID NO: 10 sequence of 15 base pair ACCAAAGANGATATT. Thus, the sequences in SEQ ID Nos: 9 and 10 differ more than 25 %. And further the reference claim 8 recites the sequences of SEQ ID Nos 9 and 10, which differ by more than 9 nucleotides of the 15 nucleotides, which would make more than 25 % different. And further the reference claim 1 recites that the different oligonucleotide probes 9 to 20 nucleotides in length. Thus, the reference clearly teaching array having probes greater than 16 nucleotides, and adjacent nucleotides have at least 25 % nucleotides. The new claim 148 has been included in this rejection because, Chee et al teach throughout the patent teach that the

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array having different oligonucleotide probes reads on the new claim 148 limitations. Thus, rejections of record have been maintained for the reasons of record.

21. Applicant's arguments filed on 8/16/04, regarding the provisional obviousness-type double patenting rejection over 08/794,851, have been fully considered but they are not persuasive.

Claims 120-125, 128, 136-137 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over allowed claims of copending Application No. 08/794,851. Although the conflicting claims are not identical, they are not patentably distinct from each other because the reference method of identifying one or more plurality of sequences differing by one or more single base changes in a plurality of target nucleotide sequences uses the array of the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Applicants argue that 'during the prosecution of the '851 application, the Office has imposed restriction requirement between the method of identifying a sequence / a kit for doing so, a method for forming an array, and an array.' In the '851 application, the method of identifying a sequence / a kit for doing so was elected, subsequently, applicants filed the present divisional application to cover array claims. In view of the imposition of restriction requirement, 35 USC. 121 preclude making a double patenting rejection. Accordingly, the double patenting rejection based on the '851 application should be withdrawn.

Applicant's arguments have been considered and are not persuasive.

The current array claims in this application (09/963,920) are different from the originally claimed restricted out array claims in the '851 application. The array claim represented by the independent claim 120 of 09/963,920 application recites 'an array of oligonucleotide probes on

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a solid support comprising: a solid support having an array of positions each suitable for coupling an oligonucleotide probe; a linker suitable for coupling an oligonucleotide probe to the solid support and attached to the solid support at each of the array positions; and an array of capture oligonucleotide probes on the solid support at array positions having greater than sixteen nucleotides and substantially similar thermal stabilities, wherein each capture oligonucleotide probe of the array differs from its adjacent capture oligonucleotide probe by at least 25 % of the nucleotides.'

And the '851 application, restricted out array claim 120 recites 'an array of oligonucleotide probes on a solid support comprising: a solid support having an array of positions each suitable for coupling an oligonucleotide; a linker or support suitable for coupling an oligonucleotide to the solid support attached to the solid support at each of the array positions; and an array of oligonucleotides on the solid support with at least some of the array positions oligonucleotides being occupied by oligonucleotides having greater than sixteen nucleotides.'

The originally claimed 120 in the '851 application is distinct from the current application claim 120. If these two claims were present at the time the original restriction was made, the claims could have been restricted into two different groups based on the composition of the array, i.e., each different probe differs from the adjacent probe by at least 25 % different nucleotides; and probes have substantially similar thermal stabilities. Thus, the originally restricted array claim 120 of the '851 is different from the instant claims, and the obviousness-type double patenting rejection of record is proper. And new claim 148 has been included in this rejection, since the '851 application recites that the plurality of capture oligonucleotides each have a different nucleotide sequences.

Conclusion

22. No claims are allowed.

23. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Padmashri Ponnaluri whose telephone number is 571-272-0809. The examiner is on Increased Flex Schedule and can normally be reached From Monday through Friday between 7 AM and 3.30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on 571-272-0811. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


PADMASHRI PONNALURI
PRIMARY EXAMINER

Padmashri Ponnaluri
Primary Examiner
Art Unit 1639
26 October 2004